C01P

INDEXING SCHEME RELATING TO STRUCTURAL AND PHYSICAL ASPECTS OF SOLID INORGANIC COMPOUNDS

Definition statement

This place covers:

The classification scheme C01P is systematically applied for classification of crystal-structural features (C01P 2002/00-C01P 2002/90), particle morphologies (C01P 2004/00-C01P 2004/90) and properties (C01P 2006/00-C01P 2006/90) of solid inorganic materials. The scheme is used for all incoming documents classified in C01B-C01G and in C09C from 1994 onwards. Although gradually extended, the major part of the present scheme is operational from 2003.

The back-log of the following C01-groups is completely classified according to the C01P-scheme:

C01B 13/14-C01B 13/366 (oxides in general complete)

C01B 17/20-C01B 17/46

C01B 19/00-C01B 19/04 (all selenides, tellurides)

C01B 21/06-C01B 21/076 (all nitrides)

C01B 21/082-C01B 21/0828

C01B 31/30-C01B 31/36 (all carbides)

C01B 33/18-C01B 33/193

C01C 3/08-C01C 3/12 (all cyanides)

C01F 5/02-C01F 5/38

C01F 7/001-C01F 7/046

C01F 7/14-C01F 7/18

C01F 7/30-C01F 7/36

C01F 7/42-C01F 7/46

C01F 7/56-C01F 7/62

C01F 11/02-C01F 11/186

C01F 11/46-C01F 11/468

C01F 17/00

C01F 17/0012-C01F 17/0093

C01G 1/02

C01G 3/006-C01G 3/02

C01G 21/006-C01G 21/10

C01G 21/22

C01G 23/002-C01G 23/006

C01G 23/04-C01G 23/08

C01G 25/006-C01G 25/02

C01G 27/006-C01G 27/02

C01G 28/002-C01G 28/005

C01G 28/02-C01G 28/026

C01G 29/00

C01G 29/006

C01G 30/002

C01G 30/004-C01G 30/005

C01G 30/02-C01G 30/026

C01G 31/006-C01G 31/02

C01G 33/00

C01G 33/006

C01G 35/00

C01G 35/006

C01G 37/006-C01G 37/033

C01G 39/006-C01G 39/02

C01G 41/006-C01G 41/02

C01G 43/006-C01G 43/025

C01G 45/006-C01G 45/02

C01G 47/00

C01G 47/006

C01G 49/0018-C01G 49/08

C01G 51/006

C01G 51/04

C01G 53/006

C01G 53/04

C01G 55/002

C01G 55/004

C01G 56/003

C01G 56/005

C01G 99/00

C01G 99/006

Special rules of classification

This classification scheme is applicable to the whole class C01 and subclass C09C.

Classes are attributed as complete as possible which can easily result in a number of 3 to 10 C01P-classes attributed per document.

C01P 2002/00

Crystal-structural characteristics

Definition statement

This place covers:

Features relating to the crystal structure of inorganic compounds, which are independent from the size of the particles (C01P 2004/00) and which cannot be qualified as a macroscopic physical property (C01P 2006/00).

C01P 2002/01

depicted by a TEM-image

Definition statement

This place covers:

Any image obtained by TEM or HRTEM, of particles completely or partially.

References

Limiting references

This place does not cover:

TEM-images showing X-Ray data:	C01P 2002/72
TEM- (or SEM-) images of particles:	C01P 2004/03 (respectively C01P 2004/04)

Special rules of classification

Care should be taken not to use this class for SEM- (Scanning Electron Microscope) images which are not used for depicting crystal structures.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

TEM:	Transmission Electron Microscope
HRTEM:	High-resolution Transmission Electron Microscope
SEM:	Scanning Electron Microscope

C01P 2002/02

Amorphous compounds

Definition statement

This place covers:

Mostly only attributed to compounds which are described as being 100% amorphous.

C01P 2002/10

One-dimensional structures

References

Limiting references

This place does not cover:

One-dimensional particles:	C01P 2004/10

C01P 2002/20

Two-dimensional structures

References

Limiting references

This place does not cover:

Two-dimensional particles:	C01P 2004/20

C01P 2002/22

layered hydroxide-type, e.g. of the hydrotalcite-type

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Hydrotalcite:	$Mg_6Al_2(OH)_{16}CO_3 \cdot 4H_2O$

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

LDH:	Layered Double Hydroxide

C01P 2002/30

Three-dimensional structures

Definition statement

This place covers:

Structures not classified below, e.g. compounds with the garnet-structure

References

Limiting references

This place does not cover:

Three-dimensional particles:	C01P 2004/30

C01P 2002/32

spinel-type (AB_2O_4)

Definition statement

This place covers:

All compounds with the spinel structure.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Spinel:	$MgAl_2O_4$

C01P 2002/34

perovskite-type (ABO_3)

Definition statement

This place covers:

All compounds with the perovskite structure.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Perovskite:	$CaTiO_3$

C01P 2002/50

Solid solutions

Definition statement

This place covers:

Structures wherein one or more cations or anions can be replaced by other ion without change of the crystal structure.

Special rules of classification

Complete solid solutions are double classified according to both end members.

C01P 2002/52

containing elements as dopants

Definition statement

This place covers:

The definition of dopant differs depending on the technical field.

In class C01 regarding the amount of replacing cation or anion is a limit value of about 5 atom-% taken as a rule.

C01P 2002/60

Compounds characterised by their crystallite size

Definition statement

This place covers:

The crystallite size differs from the particle size (C01P 2004/60-C01P 2004/64) in that it concerns the crystalline domain size, i.e. the smallest single crystalline part of the material.

References

Limiting references

This place does not cover:

Characterizations of (primary or secondary) particle sizes:	C01P 2004/60

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Crystallite size:	The expression 'crystallite size' refers to the volume of powder material having one single crystalline structure. Mostly powders are polycrystalline and consist of a large number of crystallites held together by a crystallite- (or grain-) boundary.

C01P 2002/72

by d-values or two theta-values, e.g. as X-ray diagram

Definition statement

This place covers:

Tables or X-ray diagrams specifying d- or two theta-values together with intensities.

References

Limiting references

This place does not cover:

Compounds indicated by their crystallinity index:	C01P 2002/02
Amorphous compounds:	C01P 2002/04

C01P 2002/74

by peak-intensities or a ratio thereof only

Definition statement

This place covers:

Situations wherein only peak intensities or a ratio of two intensities are given.

References

Limiting references

This place does not cover:

Intensities and two-theta (or d-values), e.g. by specification as X-ray diagram or in a table:	C01P 2002/72

C01P 2002/76

by a space-group or by other symmetry indications

Definition statement

This place covers:

Symmetry indications: e.g. orthorhombic or hexagonal. Example: hexagonal BN.

C01P 2002/77

by unit-cell parameters, atom positions or structure diagrams

Definition statement

This place covers:

'Structure diagrams' include all two and three dimensional ways of depicting the structure of a solid material.

C01P 2002/78

by stacking-plane distances or stacking sequences

Definition statement

This place covers:

E.g. layer distances as specified in layered double hydroxide compounds (as such classified in C01P 2002/22).

C01P 2002/82

by IR- or Raman-data

Definition statement

This place covers:

Infra-red and Raman spectroscopy data (0.7-300 micrometer = 700-300.000 nm)

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

IR:	Infra-Red radiation

C01P 2002/84

by UV- or VIS- data

Definition statement

This place covers:

UV and visible light data (380-750 nm wavelength).

References

Limiting references

This place does not cover:

Inorganic luminescent materials:	C09K 11/08

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

UV:	Ultra-Violet radiation
VIS:	Visible radiation ('Light')

C01P 2002/85

by XPS, EDX or EDAX data

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

XPS:	X-ray Photoelectron Spectroscopy
EDX:	Energy Dispersive X-ray Spectroscopy
EDAX:	Energy Dispersive X-ray Analytical Spectroscopy
EDS:	Energy Dispersive Spectroscopy

C01P 2002/86

by NMR- or ESR-data

Definition statement

This place covers:

Nuclear Magnetic Resonance and Electron Spin Resonance data.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

NMR:	Nuclear Magnetic Resonance
ESR:	Electron Spin Resonance data

C01P 2002/87

by chromatography data, e.g. HPLC, gas chromatography

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

HPLC:	High-Performance Liquid Chromatography

C01P 2002/88

by thermal analysis data, e.g. TGA, DTA, DSC

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

TGA:	Thermal Gravimetric Analysis
DTA:	Differential Thermal Analysis
DSC:	Differential Scanning Calorimetry

C01P 2004/00

Particle morphology

Definition statement

This place covers:

Features relating to the size or shape of particles of inorganic compounds.

C01P 2004/03

obtained by SEM

Special rules of classification

Care should be given not to confuse SEM (Scanning Electron Microscope) and TEM (Transmisson Electron Micrsocope) images.

Check the description carefully about this. Mostly is the magnification factor an indicator.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

SEM:	Scanning Electron Microscopy

C01P 2004/04

obtained by TEM, STEM, STM or AFM

Special rules of classification

Care should be given not to confuse SEM (Scanning Electron Microscope) and TEM (Transmisson Electron Micrsocope) images.

Check the description carefully about this. Mostly is the magnification factor an indicator.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

TEM:	Transmission Electron Microscopy
STEM:	Scanning Transmission Electron Microscopy
STM:	Scanning Tunneling Microscopy
AFM:	Atomic Force Microscopy

C01P 2004/10

extending in one dimension, e.g. needle-like

Definition statement

This place covers:

All those particles whereby one dimension is significantly larger that the other two.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "needle-like"and "acicular"

C01P 2004/11

with a prismatic shape

Definition statement

This place covers:

The shape refers to the section considered perpendicular to the length.

C01P 2004/12

with a cylindrical shape

Definition statement

This place covers:

The shape refers to the section considered perpendicular to the length.

C01P 2004/13

Nanotubes

Definition statement

This place covers:

Nanotubes as defined by ISO/TS 27687 (available in BNS as XP008113666): being hollow nanofibres whereby a nanofibre is a nano-object with two external dimensions in the nanoscale (1-100 nm).

C01P 2004/16

Nanowires or nanorods, i.e. solid nano-fibres with two nearly equal dimensions between 1-100 nanometer

Definition statement

This place covers:

Nanofibres as defined by ISO/TS 27687 and further limited to those solid nanofibres with nearly equal dimensions in the nanoscale (1-100 nm).

C01P 2004/17

Nanostrips, nanoribbons or nanobelts, i.e. solid nano-fibres with two significantly differing dimensions between 1-100 nanometer

Definition statement

This place covers:

Nanofibres as defined by ISO/TS 27687 and further limited to those solid nanofibres with nearly equal dimensions in the nanoscale (1-100 nm).

C01P 2004/20

extending in two dimensions, e.g. plate-like

Definition statement

This place covers:

All those particles whereby two dimensions are significantly larger than the third one.

C01P 2004/24

Nanoplates, i.e. plate-like particles with a thickness from 1-100 nanometer

Definition statement

This place covers:

Nanoplates as defined by ISO/TS 27687 and further defined as particles with only one dimension in the nanoscale (1-100 nm).

C01P 2004/30

extending in three dimensions

Definition statement

This place covers:

All those particles of particular shape and not belonging to C01P 2004/10 or C01P 2004/20.

C01P 2004/45

Aggregated particles or particles with an intergrown morphology

Definition statement

This place covers:

Aggregates in which particles are hold together by strong forces (chemical bonds also qualified as cementation) and wherein the resulting external surface area is significantly smaller than the sum of the surface area of the individual components.

C01P 2004/50

Agglomerated particles

Definition statement

This place covers:

Agglomerates in which particles are hold together by weak forces (Van der Waals forces or simple physical entanglement) and wherein the resulting external surface area is about similar to the sum of the surface area of the individual components.

C01P 2004/51

Particles with a specific particle size distribution

Definition statement

This place covers:

Any particle size distribution (e.g. three size distribution peaks) not classified in C01P 2004/52 or C01P 2004/53

C01P 2004/52

highly monodisperse size distribution

Definition statement

This place covers:

Documents in which the particle size distribution is qualified as monodisperse or by a narrow size distribution curve.

C01P 2004/54

Particles characterised by their aspect ratio, i.e. the ratio of sizes in the longest to the shortest dimension

Special rules of classification

This class is mostly given in case of needle-like or plate-like particles (high a.r.) However also to three dimensional particles in order to express the gact that they are equaxed in the three directions (low a.r.).

C01P 2004/60

Particles characterised by their size

Definition statement

This place covers:

The indication of the largest size of the particle.

Special rules of classification

In case particles are characterised by a primary and secondary particles size does the size refer to the secondary particle size.

In case a document discloses a range for the particle size is the whole range classified including the both end members of the range.

Examples:

disclosed: d= 50-250 nm, classes given: C01P 2004/64, C01P 2004/62

disclosed: d= 0,25-80 micrometer, classes given: C01P 2004/62, C01P 2004/61

C01P 2004/64

Nanometer sized, i.e. from 1-100 nanometer

Definition statement

This place covers:

Nanoparticles as defined by ISO/TS 27687: being nano-objects with all three dimensions in the nanoscale (1-100 nm).

C01P 2006/00

Physical properties of inorganic compounds

Definition statement

This place covers:

Features relating to the macroscopic physical properties of inorganic compounds.

C01P 2006/10

Solid density

Definition statement

This place covers:

Values of densities for 100% full dense materials.

C01P 2006/11

Powder tap density

Definition statement

This place covers:

Density values of tapped powders without further consolidation e.g. by pressing.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Tap density	Bulk density

C01P 2006/12

Surface area

Definition statement

This place covers:

Values mostly obtained as BET-values and expressed in m^2/g.

C01P 2006/13

thermal stability thereof at high temperatures

Definition statement

This place covers:

Value mostly expressed as m^2/g after heating at a specified T and t.

C01P 2006/14

Pore volume

Definition statement

This place covers:

Mostly expressed as m^3/g.

C01P 2006/19

Oil-absorption capacity, e.g. DBP values

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

DBP	DiButyl Phthalate

C01P 2006/21

Attrition-index or crushing strength of granulates

Definition statement

This place covers:

The resistance of particles against applied mechanical forces.

C01P 2006/22

Rheological behaviour as dispersion, e.g. viscosity, sedimentation stability

Definition statement

This place covers:

Mostly aqueous suspensions of particles, e.g. of calcium carbonate in water.

References

Limiting references

This place does not cover:

Emulsifiers as such	B01F 17/00

C01P 2006/32

Thermal properties

Definition statement

This place covers:

E.g. thermal conductivity of AlN.

C01P 2006/60

Optical properties, e.g. expressed in CIELAB-values

Definition statement

This place covers:

Colour of inorganic materials.

C01P 2006/80

Compositional purity

Definition statement

This place covers:

In general only added in combination with EC's which explicitly does address the purity of a product compound. Documents classified in purification-groups (e.g. C01F 7/46) should exceptionally get this code.

C01P 2006/82

water content

Definition statement

This place covers:

E.g. water content after dehydration treatments.